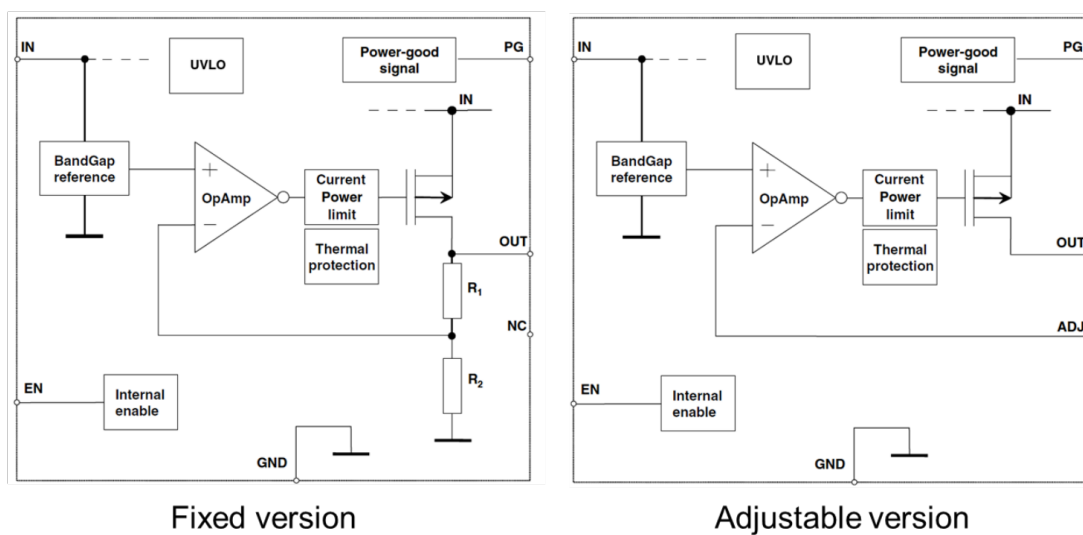


1 Block diagram

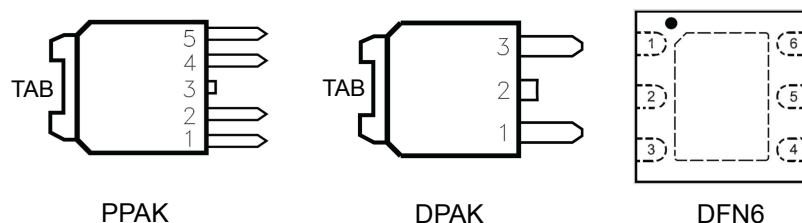
Figure 1. Block diagram (generic version)



AM13903V1

2 Pin configuration

Figure 2. Pin connection (top view)



AM13904V1

Table 1. Pin description DPAK, PPAK

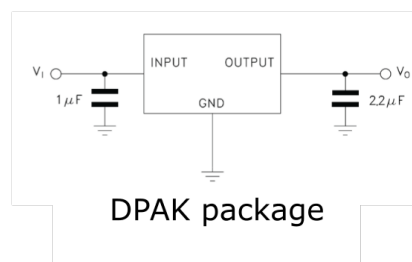
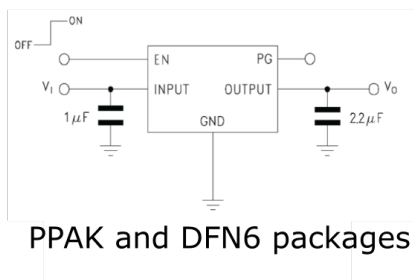
Pin n°		Symbol	Function
PPAK	DPAK		
5	-	ADJ/PG	For adjustable versions: error amplifier input pin. For fixed version: Power Good output
2	1	V_{IN}	Input voltage
4	3	V_{OUT}	Output voltage
1	-	EN	Enable pin logic input: Low = shutdown, High = active
3	2	GND	Ground
TAB	TAB	GND	Ground

Table 2. Pin description DFN6-2x2 and 3x3

Pin n°	Symbol	Function
2	ADJ/NC	For adjustable versions: error amplifier input pin. For fixed version: not connected
6	V_{IN}	Input voltage
1	V_{OUT}	Output voltage
5	EN	Enable pin logic input: low = shutdown, high = active
3	PG	Power good output
4	GND	Ground
exposed pad	GND	Ground

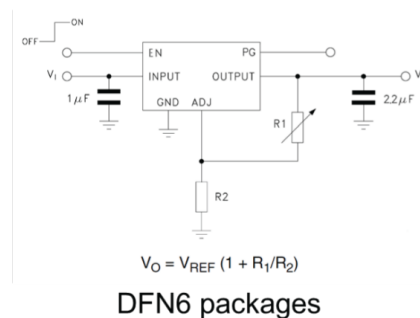
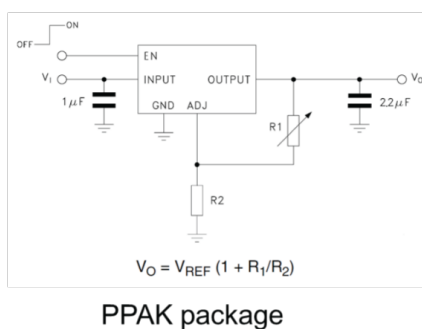
3 Typical application

Figure 3. Fixed versions



AM13905V1

Figure 4. Adjustable version (PPAK and DFN6 packages only)



AM13906V1

4 Absolute maximum ratings

Table 3. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{IN}	DC input voltage	- 0.3 to 20	V
V_{OUT}	DC output voltage	- 0.3 to $V_{IN} + 0.3$	V
V_{EN}	Enable input voltage	- 0.3 to $V_{IN} + 0.3$	V
V_{ADJ}	Adjust pin voltage	- 0.3 to 2	V
V_{PG}	Power Good pin voltage	- 0.3 to $V_{IN} + 0.3$	V
I_{LOAD}	Output current	Internally limited	mA
P_D	Power dissipation	Internally limited	mW
T_{STG}	Storage temperature range	- 65 to 150	°C
T_{OP}	Operating junction temperature range	- 40 to 125	°C

Note: Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. All values are referred to GND.

Table 4. Thermal data

Symbol	Parameter	Value				Unit
		PPAK	DPAK	DFN6-2x2	DFN6-3x3	
R_{thJA}	Thermal resistance junction-ambient	100	100	65	55	°C/W
R_{thJC}	Thermal resistance junction-case	8	8	6.5	10	°C/W

5 Electrical characteristics

$T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = V_{OUT(NOM)} + 1\text{ V}$ (For $V_{OUT} < 1.5\text{ V}$; $V_{IN} = 2.5\text{ V}$.), $C_{IN} = 1\text{ }\mu\text{F}$, $C_{OUT} = 2.2\text{ }\mu\text{F}$, $I_{LOAD} = 10\text{ mA}$, $V_{EN} = 2\text{ V}$, unless otherwise specified.

Table 5. Electrical characteristics for LDFM (fixed versions)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{IN}	Operating input voltage		2.5		16	V
V_{OUT}	V_{OUT} accuracy, PPAK and DFN6 versions	$V_{OUT}+1\text{ V} \leq V_{IN} \leq 16\text{ V}^{(1)}$ $I_{LOAD} = 10\text{ mA}$	-1		1	%
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$ $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$	-1.5		1.5	%
V_{OUT}	V_{OUT} accuracy, DPAK version	$V_{OUT}+1\text{ V} \leq V_{IN} \leq 16\text{ V}^{(1)}$ $I_{LOAD} = 10\text{ mA}$	-2		2	%
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$ $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$	-3		3	%
ΔV_{OUT}	Static line regulation	$V_{OUT}+1\text{ V} \leq V_{IN} \leq 16\text{ V}^{(1)}$		0.01		%V
		$V_{OUT}+1\text{ V} \leq V_{IN} \leq 16\text{ V}^{(1)}$ $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$			0.04	
ΔV_{OUT}	Static load regulation	$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$		0.1		%A
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$, $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$		0.15	0.4	
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$, $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$ DFN6 version			10	mV
V_{DROP}	Dropout voltage ⁽²⁾	$I_{LOAD} = 500\text{ mA}$, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		125	300	mV
I_Q	Quiescent current	ON mode: $V_{EN} = 2\text{ V}$ $I_{LOAD} = 10\text{ mA to }500\text{ mA}$, $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$		200	800	μA
		OFF Mode: $V_{EN} = \text{GND}$, PPAK and DFN versions		30		
		OFF Mode: $V_{EN} = \text{GND}$, PPAK and DFN versions, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$			120	
I_{SC}	Short-circuit current			0.8		A
V_{EN}	Enable input logic low	$V_{IN} = 2.5\text{ V to }16\text{ V}$, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$			0.8	V
	Enable input logic high		2			
I_{EN}	Enable pin input current	$V_{EN} = V_{IN}$		5	10	μA
PG	Power Good output threshold	Rising edge		$0.92 \cdot V_{OUT}$		V
		Falling edge		$0.8 \cdot V_{OUT}$		
	Power Good output voltage low	$I_{SINK} = 6\text{ mA}$, open drain output		0.4		

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
SVR	Supply voltage rejection	$V_{IN} = 6\text{ V} \pm 0.5\text{ V}_{\text{RIPPLE}}$ Freq. = 120 Hz, $V_{OUT} = 5\text{ V}$		60		dB
		$V_{IN} = 6\text{ V} \pm 0.5\text{ V}_{\text{RIPPLE}}$ Freq. = 10 kHz, $V_{OUT} = 5\text{ V}$		52		
e_N	Output noise voltage	Bw = 10 Hz to 100 kHz, $I_{LOAD} = 100\text{ mA}$, $C_{OUT} = 2.2\text{ }\mu\text{F}$		45		$\mu\text{V}_{\text{RMS}}/V_{OUT}$
T_{SHDN}	Thermal shutdown			170		$^{\circ}\text{C}$
	Hysteresis			10		

- For $V_{OUT} < 1.5\text{ V}$; $V_{IN} = 2.5\text{ V}$.
- Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value. This specification does not apply for output voltages below 1.5 V.

$T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = V_{OUT(\text{NOM})} + 1\text{ V}$ (For $V_{OUT} < 1.5\text{ V}$; $V_{IN} = 2.5\text{ V}$), $C_{IN} = 1\text{ }\mu\text{F}$, $C_{OUT} = 2.2\text{ }\mu\text{F}$, $I_{LOAD} = 10\text{ mA}$, $V_{EN} = 2\text{ V}$, unless otherwise specified.

Table 6. Electrical characteristics for LDFM (adjustable version)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{IN}	Operating input voltage		2.5		16	V
V_{ADJ}	Reference voltage	$V_{IN} = V_{OUT} + 1\text{ V}$ ⁽¹⁾		0.8		V
	Reference voltage tolerance	$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 16\text{ V}$ ⁽¹⁾ $I_{LOAD} = 10\text{ mA}$	-1		1	%
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$ $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$	-1.5		1.5	
ΔV_{OUT}	Static line regulation	$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 16\text{ V}$ ⁽¹⁾		0.01		% / V
		$V_{OUT} + 1\text{ V} \leq V_{IN} \leq 16\text{ V}$, ⁽¹⁾ $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$			0.04	
ΔV_{OUT}	Static load regulation	$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$		0.06		% / A
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$, $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$		0.2	0.4	
		$10\text{ mA} \leq I_{LOAD} \leq 500\text{ mA}$, $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$ DFN6 version			10	mV
V_{DROP}	Dropout voltage ⁽²⁾	V_{OUT} fixed to 2.5 V, $I_{LOAD} = 500\text{ mA}$, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$		125	300	mV
I_Q	Quiescent current	ON mode: $V_{EN} = 2\text{ V}$ $I_{LOAD} = 10\text{ mA to }500\text{ mA}$, $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$		200	800	μA
		OFF Mode: $V_{EN} = \text{GND}$, PPAK and DFN versions		30		
		OFF Mode: $V_{EN} = \text{GND}$, PPAK and DFN versions, $-40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$			120	

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{SC}	Short-circuit current			0.8		A
V_{EN}	Enable input logic low	$V_{IN} = 2.5\text{ V to }16\text{ V}, -40\text{ }^{\circ}\text{C} < T_J < 125\text{ }^{\circ}\text{C}$			0.8	V
	Enable input logic high		2			
I_{EN}	Enable pin input current	$V_{EN} = V_{IN}$		5	10	μA
PG	Power Good output threshold	Rising edge		$0.92 \cdot V_{ADJ}$		V
		Falling edge		$0.8 \cdot V_{ADJ}$		
	Power Good output voltage low	$I_{SINK} = 6\text{ mA}$, open drain output		0.4		
SVR	Supply voltage rejection	$V_{IN} = V_{OUT} + 1\text{ V} \pm 0.5\text{ V}_{RIPPLE}$ Freq. = 120 Hz, $V_{OUT} = 0.8\text{ V}$		62		dB
		$V_{IN} = V_{OUT} + 1\text{ V} \pm 0.5\text{ V}_{RIPPLE}$ Freq. = 10 kHz, $V_{OUT} = 0.8\text{ V}$		55		
e_N	Output noise voltage	Bw = 10 Hz to 100 kHz, $I_{LOAD} = 100\text{ mA}$, $C_{OUT} = 2.2\text{ }\mu\text{F}$		50		$\mu\text{V}_{RMS}/V_{OUT}$
T_{SHDN}	Thermal shutdown			170		$^{\circ}\text{C}$
	Hysteresis			10		

- For $V_{OUT} < 1.5\text{ V}$; $V_{IN} = 2.5\text{ V}$.
- Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value. This specification does not apply for output voltages below 1.5 V.

6 Application information

6.1 External capacitors

The LDFM requires external capacitors for regulator stability. These capacitors must be selected to meet the requirements of minimum capacitance and equivalent series resistance (see and). It is advisable to locate the input/output capacitors as close as possible to the relative pins.

6.1.1 Input capacitor

An input capacitor with a minimum value of 1 μF is required with the LDFM. This capacitor must be located a distance of not more than 0.5" from the input pin of the device and returned to a clean analog ground. Any good quality ceramic capacitors can be used for this capacitor.

6.1.2 Output capacitor

It is possible to use ceramic capacitors but the output capacitor must meet the requirements for minimum amount of capacitance and E.S.R. (equivalent series resistance) value.

A minimum capacitance of 2.2 μF is a good choice to guarantee the stability of the regulator. However, other C_{OUT} values can be used according to and , showing the allowable ESR range as a function of the output capacitance.

The output capacitor must maintain its ESR in the stable region over the full operating temperature range to assure stability. Also, capacitor tolerance and variation with temperature must be kept in consideration in order to assure the minimum amount of capacitance at all times.

6.2 Enable pin operation

The Enable pin can be used to turn OFF the regulator when pulled down, so drastically reducing the current consumption. When the enable feature is not used, this pin must be tied to V_{IN} to keep the regulator output ON at all times. To assure proper operation, the signal source used to drive the Enable pin must be able to swing above and below the specified thresholds listed in the electrical characteristics section (V_{EN}). The Enable pin must not be left floating because it is not internally pulled down/up.

6.3 Power Good

The LDFM features an open drain Power Good (PG) pin to sequence external supplies or loads and to provide fault detection. This pin requires an external resistor (R_{PG}) to pull PG high when the output is within the PG tolerance window. Typical values for this resistor range from 10 k Ω to 100 k Ω .

7 Typical performance characteristics

$C_{IN} = C_{OUT} = 1 \mu F$, $V_{IN} = V_{OUT} + 1 V$, V_{EN} to V_{IN} , $I_{OUT} = 10 mA$, unless otherwise specified.

Figure 5. Output voltage vs temperature

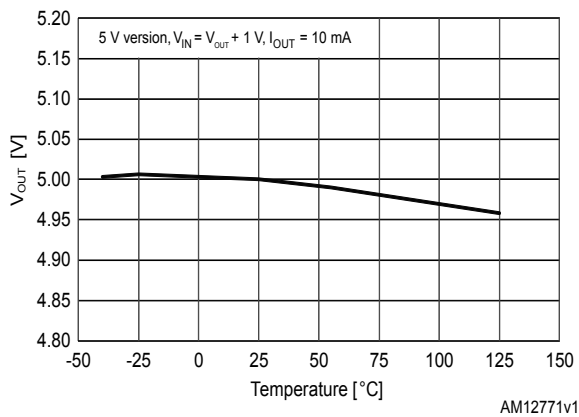


Figure 6. Output voltage vs temperature for adjustable

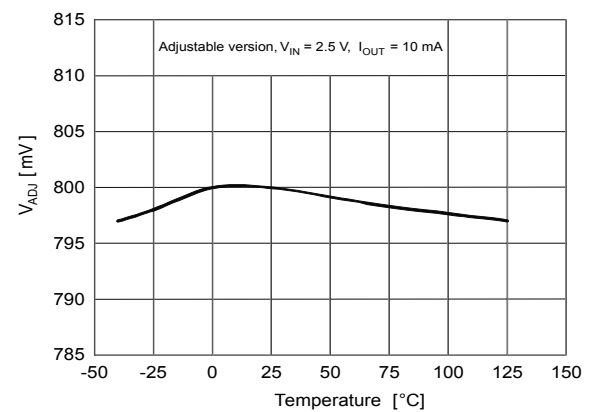


Figure 7. Line regulation vs temperature

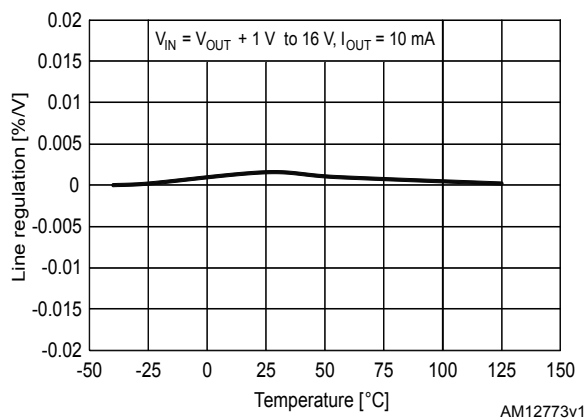


Figure 8. Load regulation vs temperature

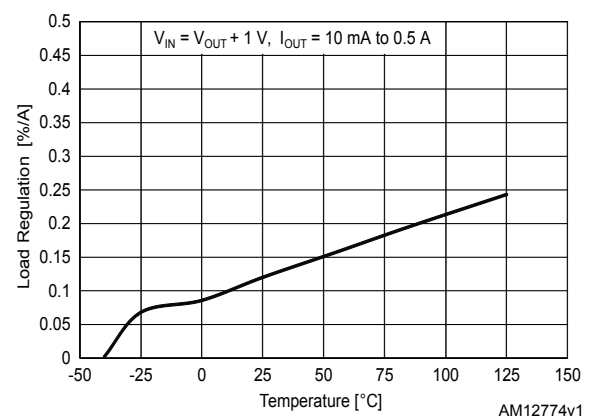


Figure 9. Short-circuit current vs drop voltage

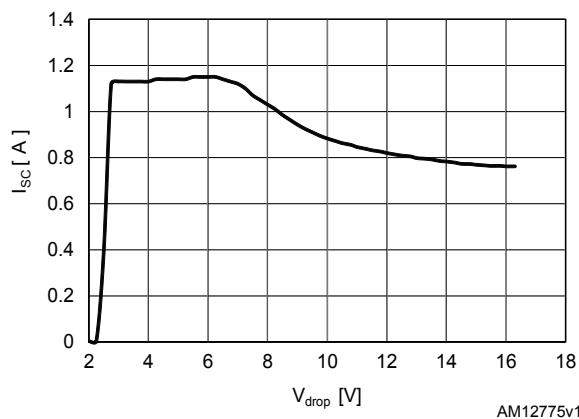


Figure 10. Dropout voltage vs temperature

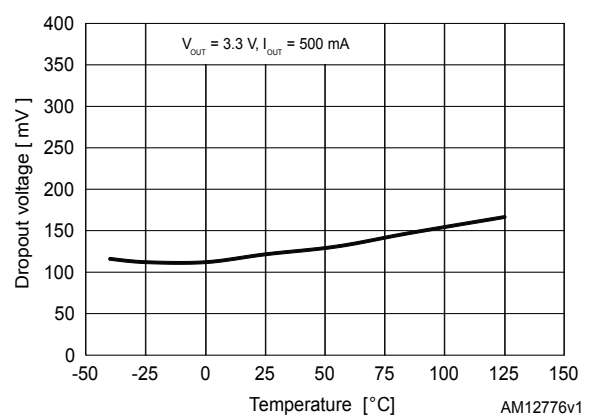


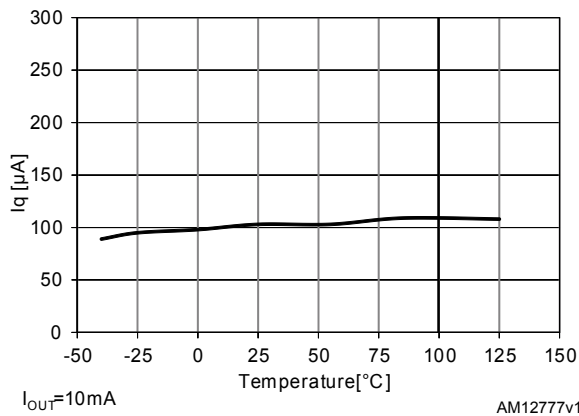
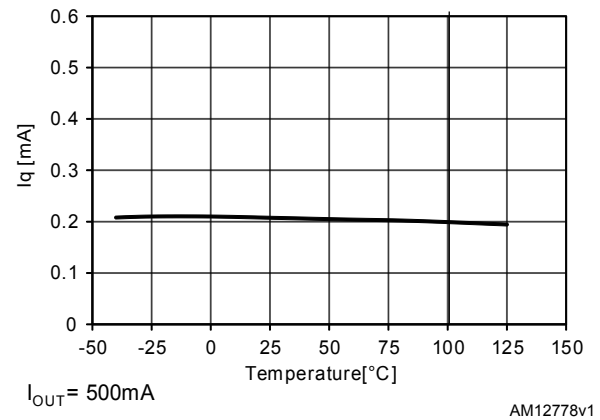
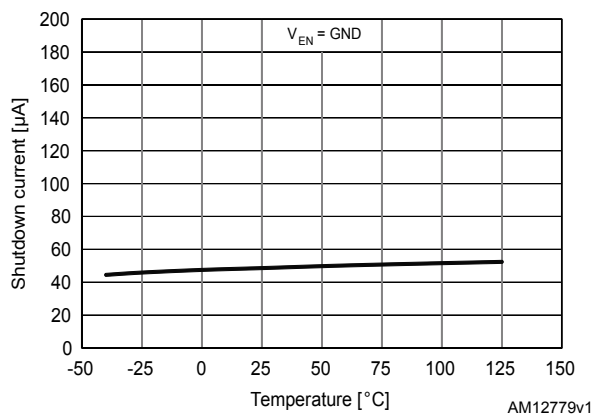
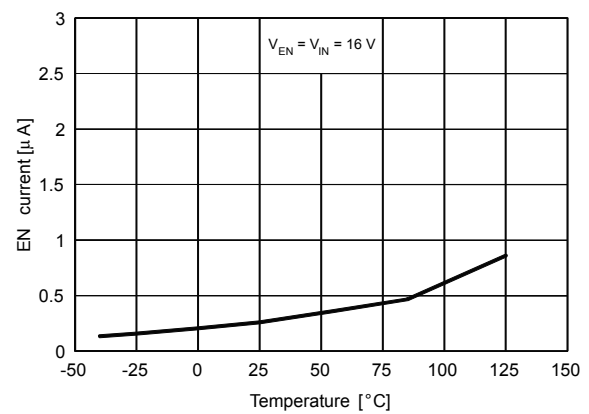
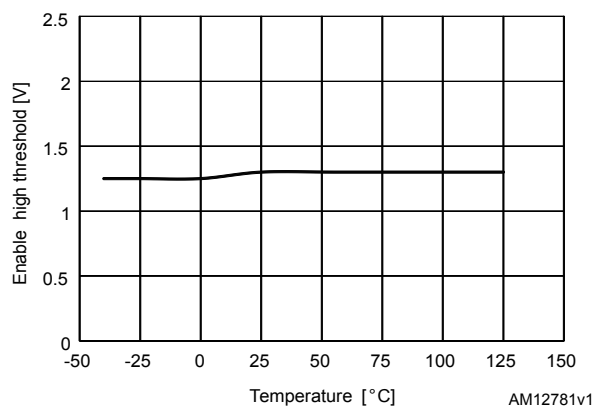
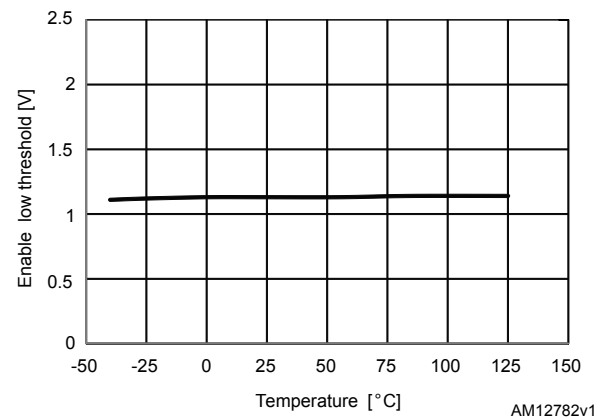
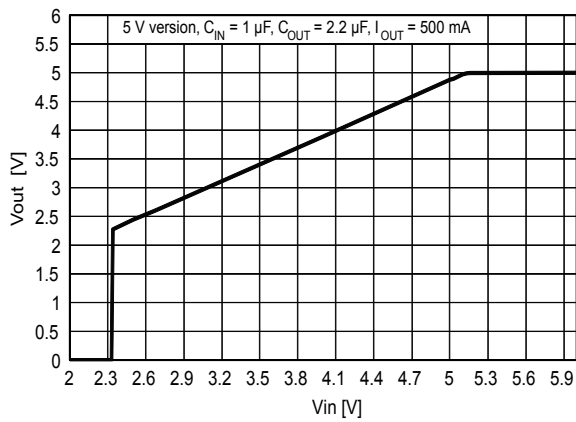
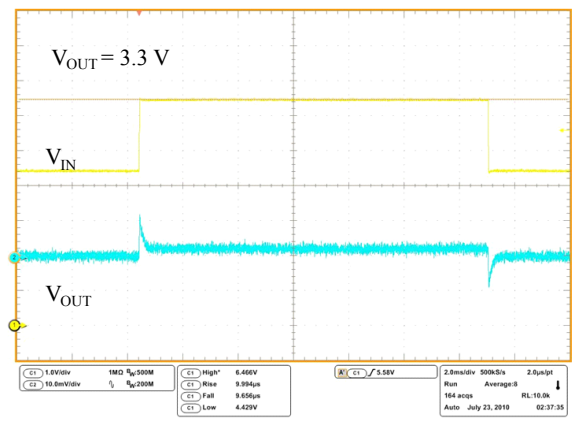
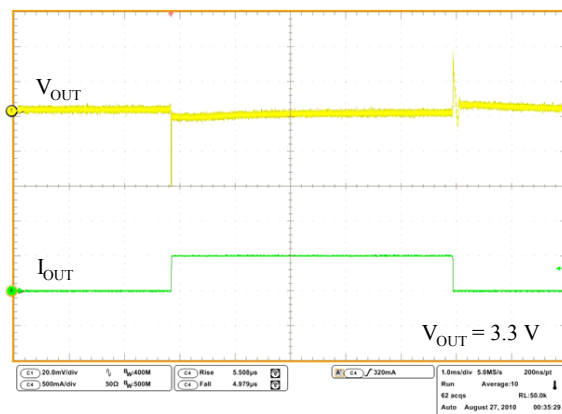
Figure 11. Quiescent current vs temperature ($I_{OUT} = 10$ mA)

Figure 12. Quiescent current vs temperature ($I_{OUT} = 500$ mA)

Figure 13. Shutdown current vs temperature

Figure 14. Enable pin current vs temperature

Figure 15. Enable high threshold vs temperature

Figure 16. Enable low threshold vs temperature


Figure 17. Output voltage vs input voltage


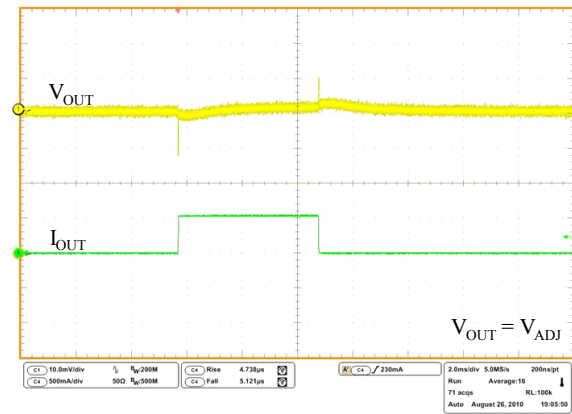
AM12783v1

Figure 18. Line transient

 $V_{IN} = \text{from } 4.5 \text{ to } 6.5 \text{ V}$, $I_{OUT} = 10 \text{ mA}$, $t_{rise} = t_{fall} = 10 \mu s$, $C_{OUT} = 2.2 \mu F$

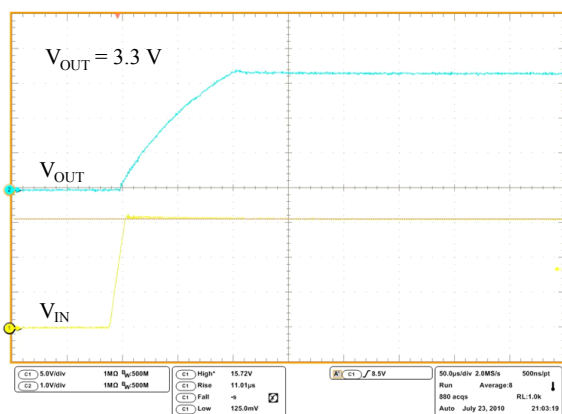
AMG060720161104MT

Figure 19. Load transient ($V_{OUT} = 3.3 \text{ V}$)

 $V_{EN} = V_{IN} = 4.5 \text{ V}$, $I_{OUT} = \text{from } 1 \text{ to } 500 \text{ mA}$, $t_{rise} = t_{fall} = 5 \mu s$, $C_{OUT} = 2.2 \mu F$

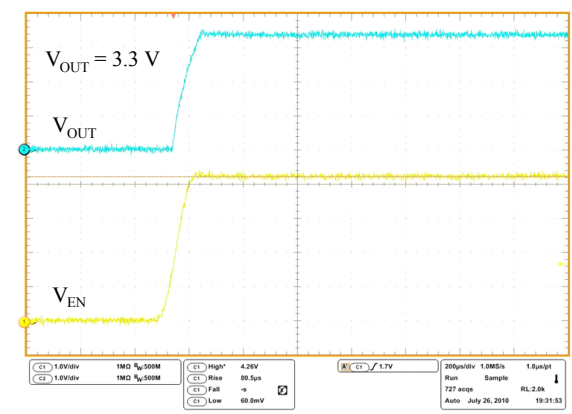
AMG060720161103MT

Figure 20. Load transient ($V_{OUT} = V_{ADJ}$)

 $V_{EN} = V_{IN} = 4.5 \text{ V}$, $I_{OUT} = \text{from } 1 \text{ to } 500 \text{ mA}$, $t_{rise} = t_{fall} = 5 \mu s$, $C_{OUT} = 2.2 \mu F$

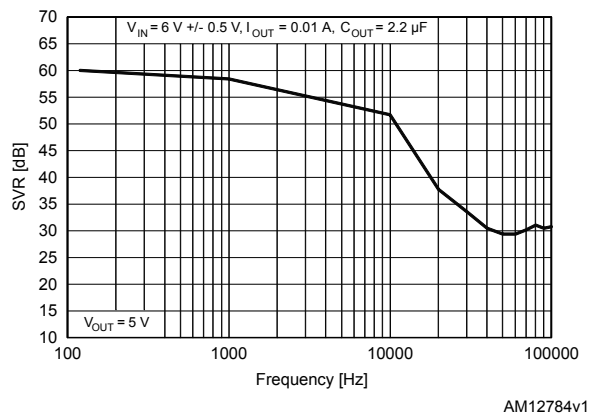
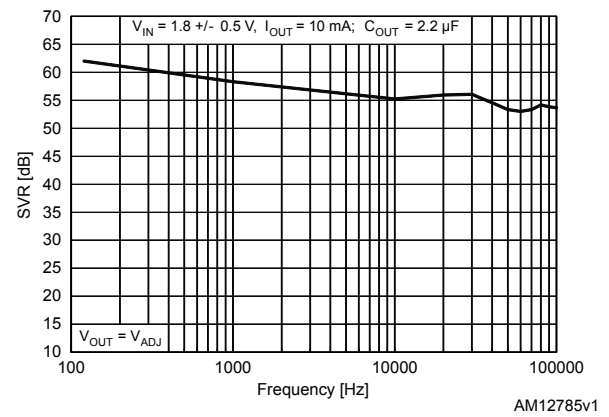
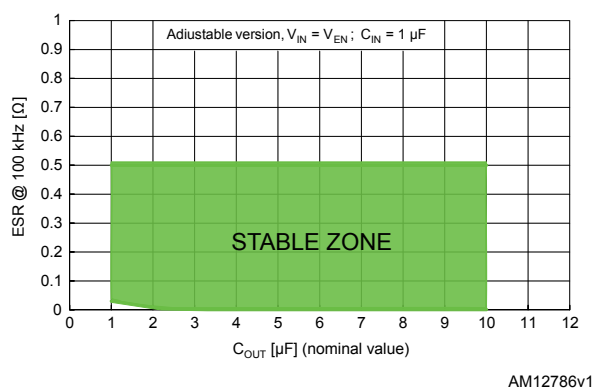
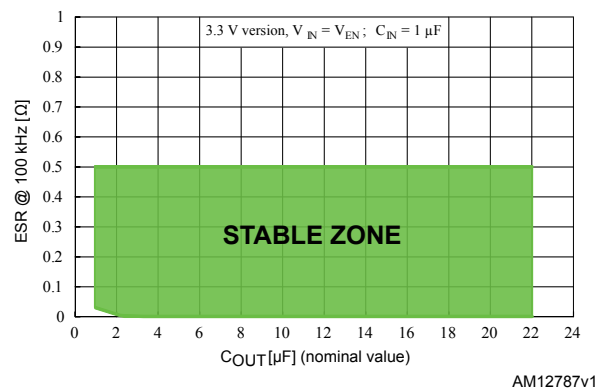
AMG060720161102MT

Figure 21. Startup transient

 $V_{EN} = V_{IN} = \text{from } 0 \text{ to } 16 \text{ V}$, $I_{OUT} = 10 \text{ mA}$, $t_{rise} = 10 \mu s$, $C_{OUT} = 2.2 \mu F$

AMG060720161101MT

Figure 22. Enable transient

 $V_{IN} = 4.3 \text{ V}$, $V_{EN} = \text{from } 0 \text{ to } 4.3 \text{ V}$, $I_{OUT} = 10 \text{ mA}$, $t_{rise} = 100 \mu s$, $C_{OUT} = 2.2 \mu F$

AMG060720161100MT

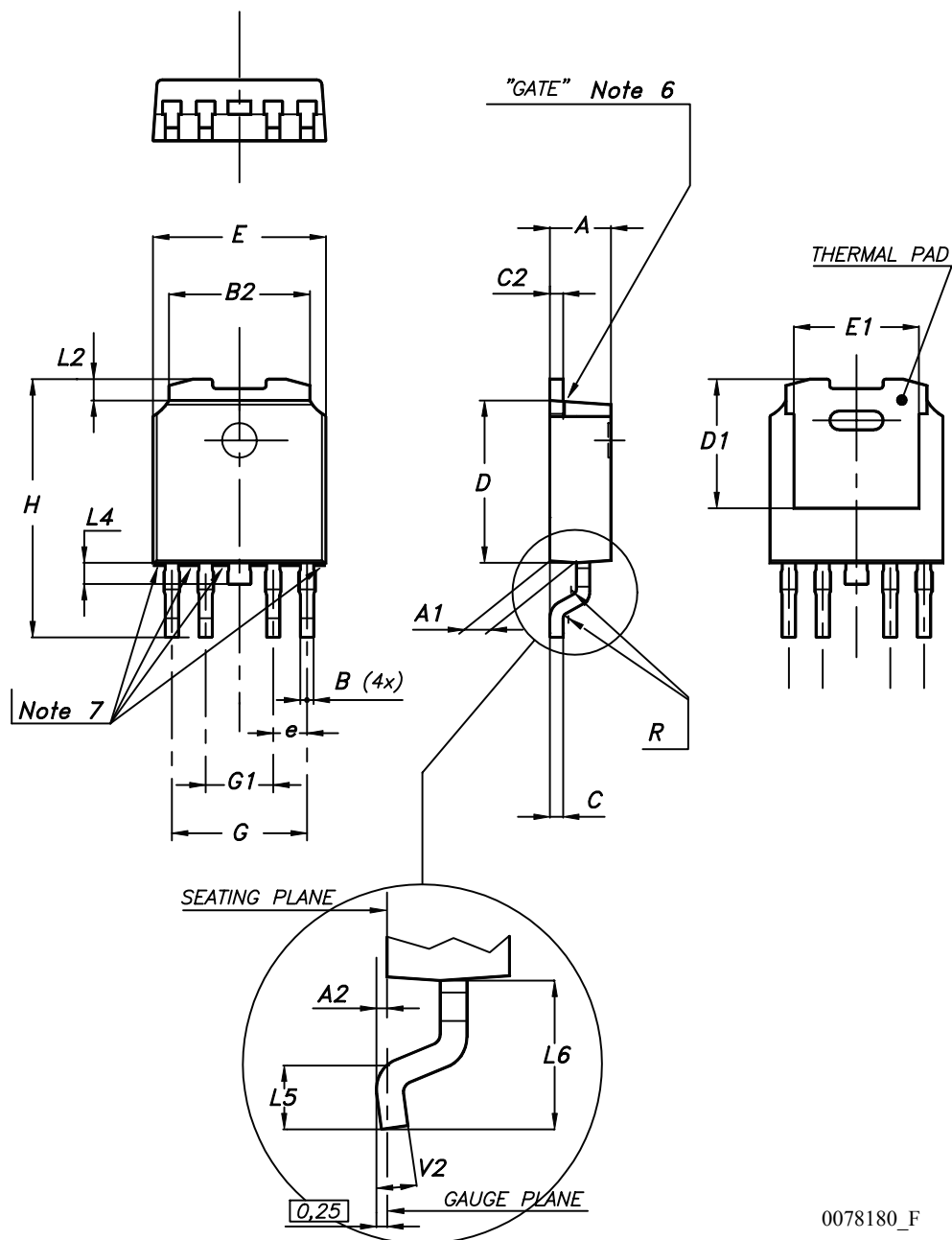
Figure 23. SVR vs frequency ($V_{OUT} = 5\text{ V}$)

Figure 24. SVR vs frequency ($V_{OUT} = V_{ADJ}$)

Figure 25. Stability plane adj (C_{OUT} , ESR)

Figure 26. Stability plane 3.3 V (C_{OUT} , ESR)


8 Package information

In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

8.1 PPAK package information

Figure 27. PPAK package outline



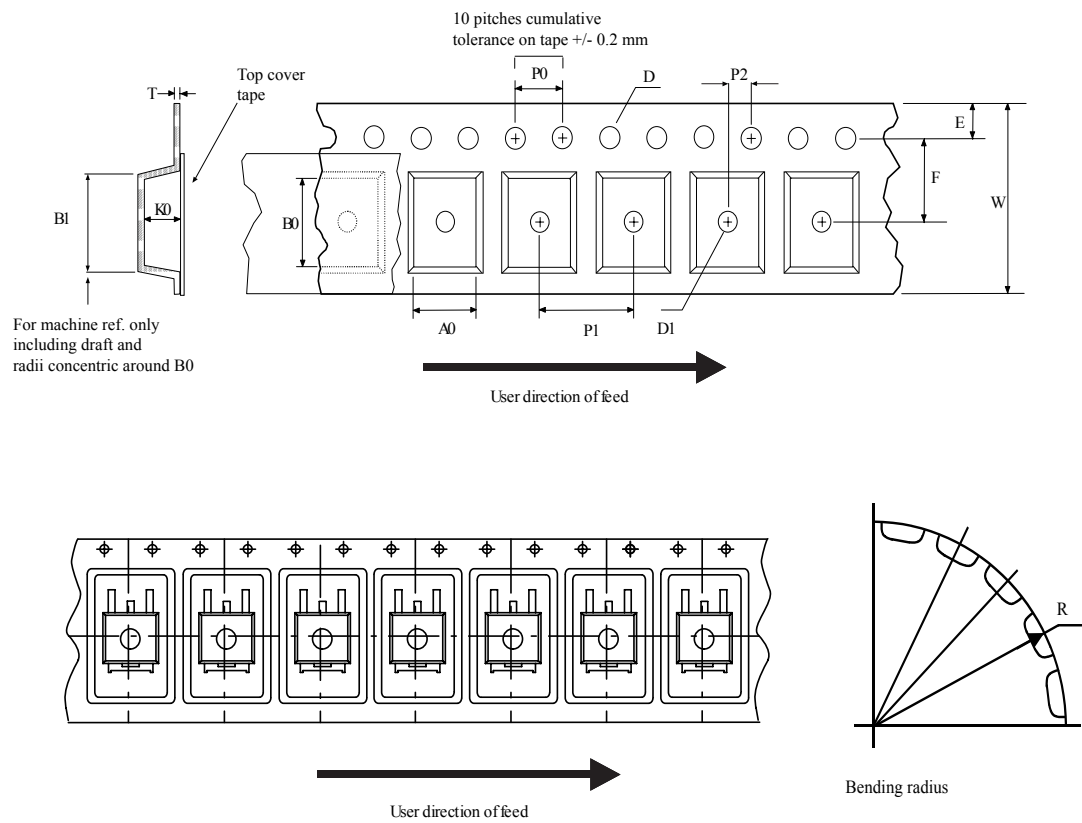
0078180_F

Table 7. PPAK mechanical data

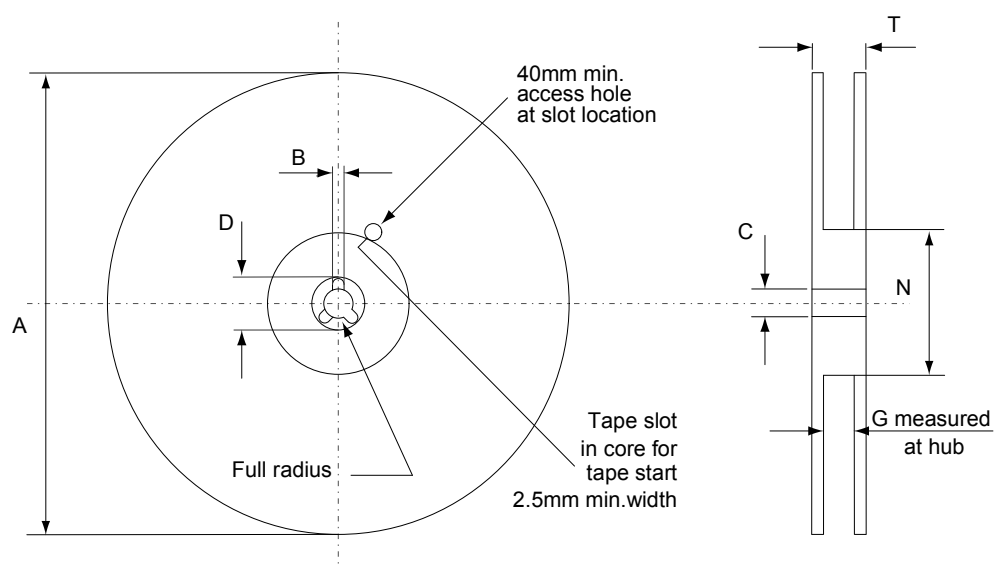
Dim.	mm		
	Min.	Typ.	Max.
A	2.2		2.4
A1	0.9		1.1
A2	0.03		0.23
B	0.4		0.6
B2	5.2		5.4
C	0.45		0.6
C2	0.48		0.6
D	6		6.2
D1		5.1	
E	6.4		6.6
E1		4.7	
e		1.27	
G	4.9		5.25
G1	2.38		2.7
H	9.35		10.1
L2		0.8	1
L4	0.6		1
L5	1		
L6		2.8	
R		0.20	
V2	0°		8°

8.2 PPAK packing information

Figure 28. PPAK tape outline



AM08852v1

Figure 29. PPAK reel outline


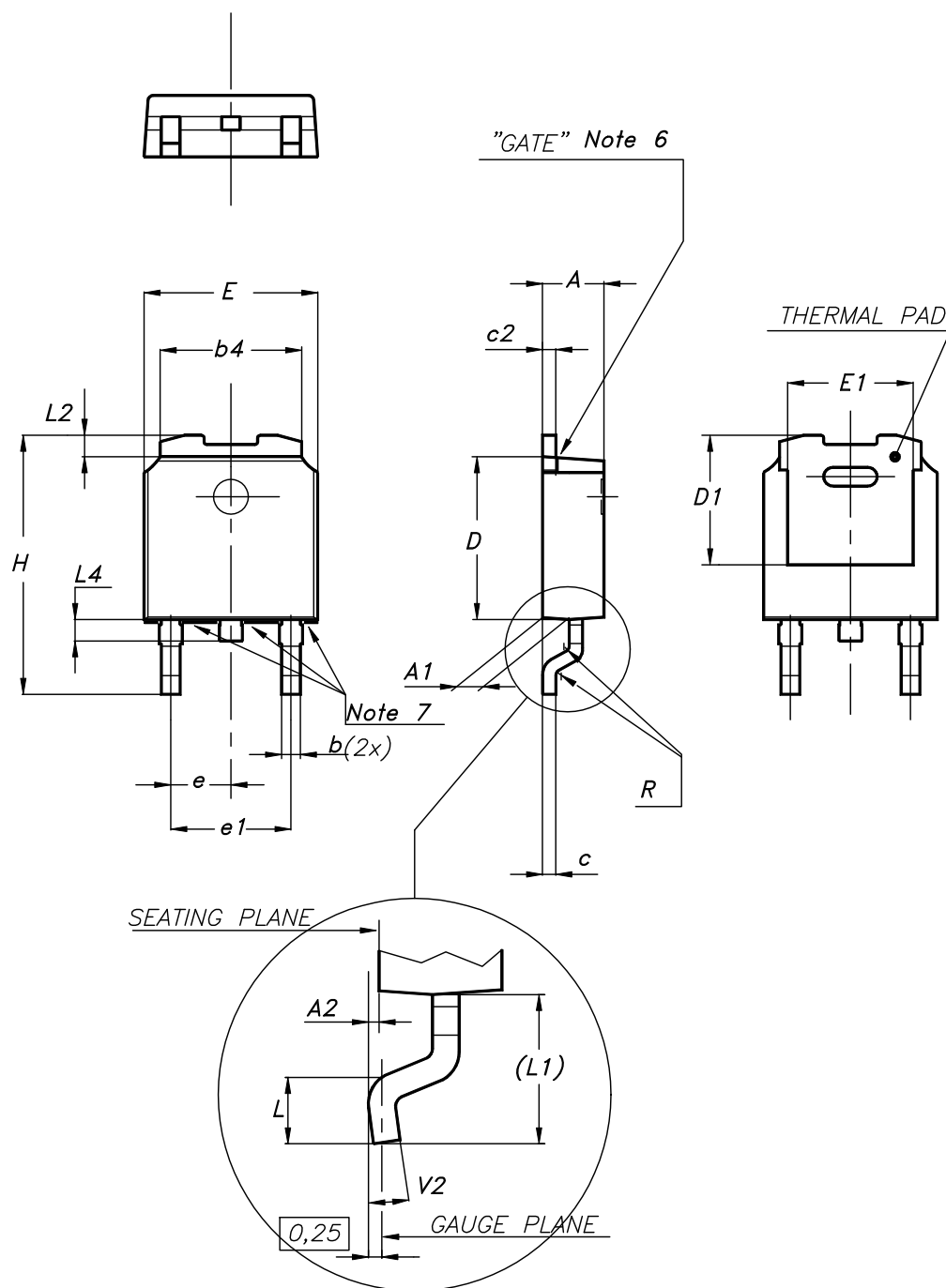
AM06038v1

Table 8. PPAK tape and reel mechanical data

Tape			Reel		
Dim.	mm		Dim.	mm	
	Min.	Max.		Min.	Max.
A0	6.8	7	A		330
B0	10.4	10.6	B	1.5	
B1		12.1	C	12.8	13.2
D	1.5	1.6	D	20.2	
D1	1.5		G	16.4	18.4
E	1.65	1.85	N	50	
F	7.4	7.6	T		22.4
K0	2.55	2.75			
P0	3.9	4.1	Base qty.		2500
P1	7.9	8.1	Bulk qty.		2500
P2	1.9	2.1			
R	40				
T	0.25	0.35			
W	15.7	16.3			

8.3 DPAK (TO-252) type A package information

Figure 30. DPAK (TO-252) package outline

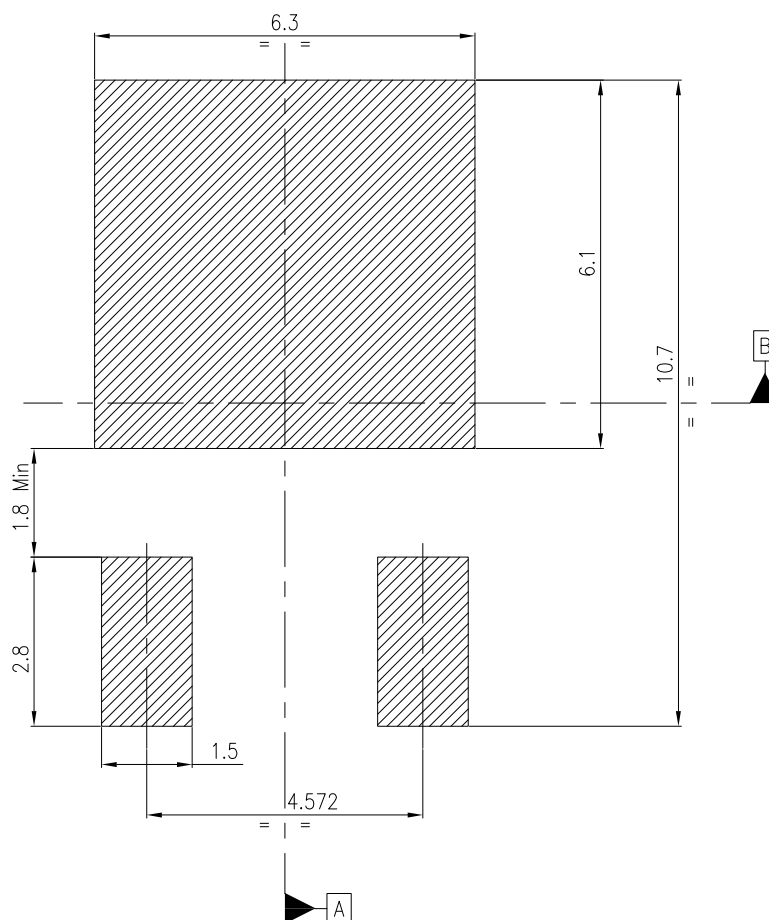


0068772_20_typA

Table 9. DPAK (TO-252) mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	2.20		2.40
A1	0.90		1.10
A2	0.03		0.23
b	0.64		0.90
b4	5.20		5.40
c	0.45		0.60
c2	0.48		0.60
D	6.00		6.20
D1		5.10	
E	6.40		6.60
E1		5.20	
e		2.28	
e1	4.40		4.60
H	9.35		10.10
L	1.00		1.50
(L1)		2.80	
L2		0.80	
L4	0.60		1.00
R		0.20	
V2	0°		8°

Figure 31. DPAK (TO-252) recommended footprint (dimensions are in mm)

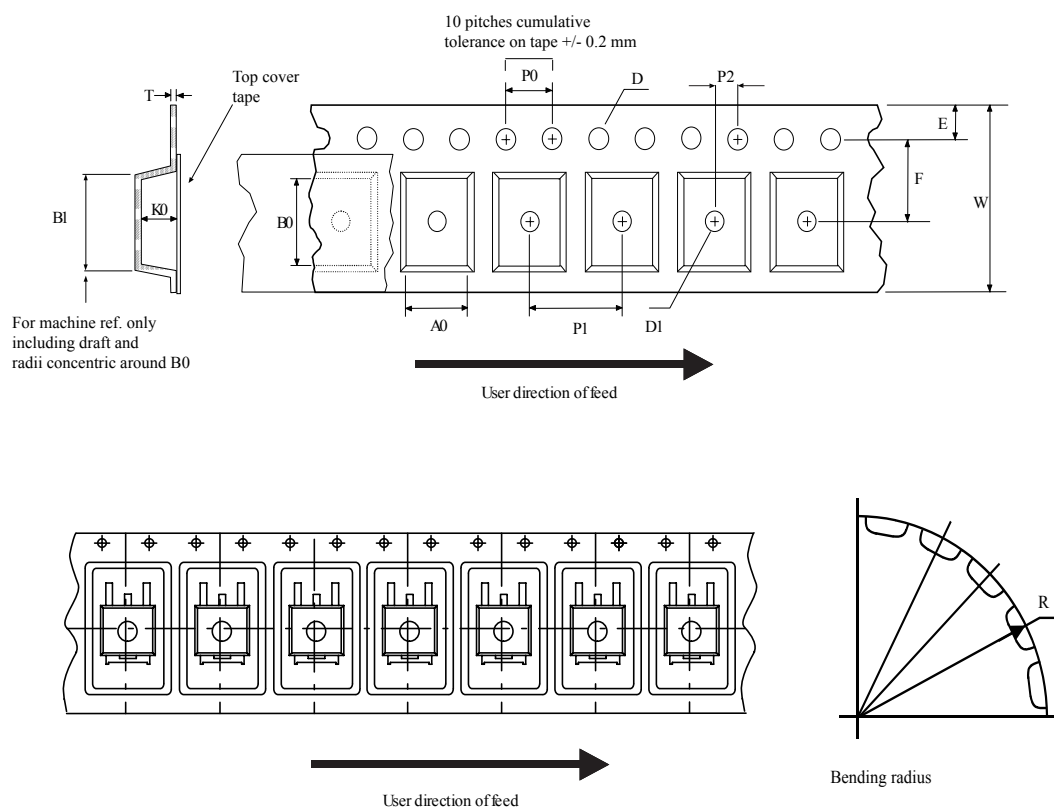


Notes:

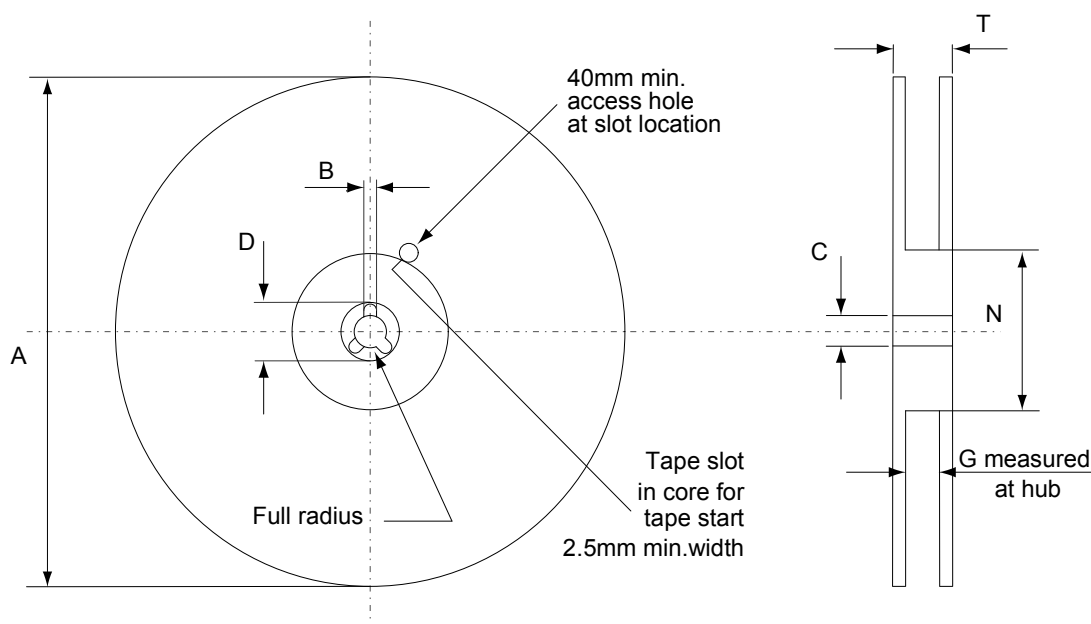
- 1) This footprint is able to ensure insulation up to 630 Vrms (according to CEI IEC 664-1)
- 2) The device must be positioned within $\oplus 0.05$ A B

8.4 DPAK (TO-252) packing information

Figure 32. DPAK (TO-252) tape outline



AM08852v1

Figure 33. DPAK (TO-252) reel outline


AM06038v1

Table 10. DPAK (TO-252) tape and reel mechanical data

Tape			Reel		
Dim.	mm		Dim.	mm	
	Min.	Max.		Min.	Max.
A0	6.8	7	A		330
B0	10.4	10.6	B	1.5	
B1		12.1	C	12.8	13.2
D	1.5	1.6	D	20.2	
D1	1.5		G	16.4	18.4
E	1.65	1.85	N	50	
F	7.4	7.6	T		22.4
K0	2.55	2.75			
P0	3.9	4.1	Base qty.		2500
P1	7.9	8.1	Bulk qty.		2500
P2	1.9	2.1			
R	40				
T	0.25	0.35			
W	15.7	16.3			

8.5 DFN6 (2x2x0,90) package information

Figure 34. DFN6 (2x2) package outline

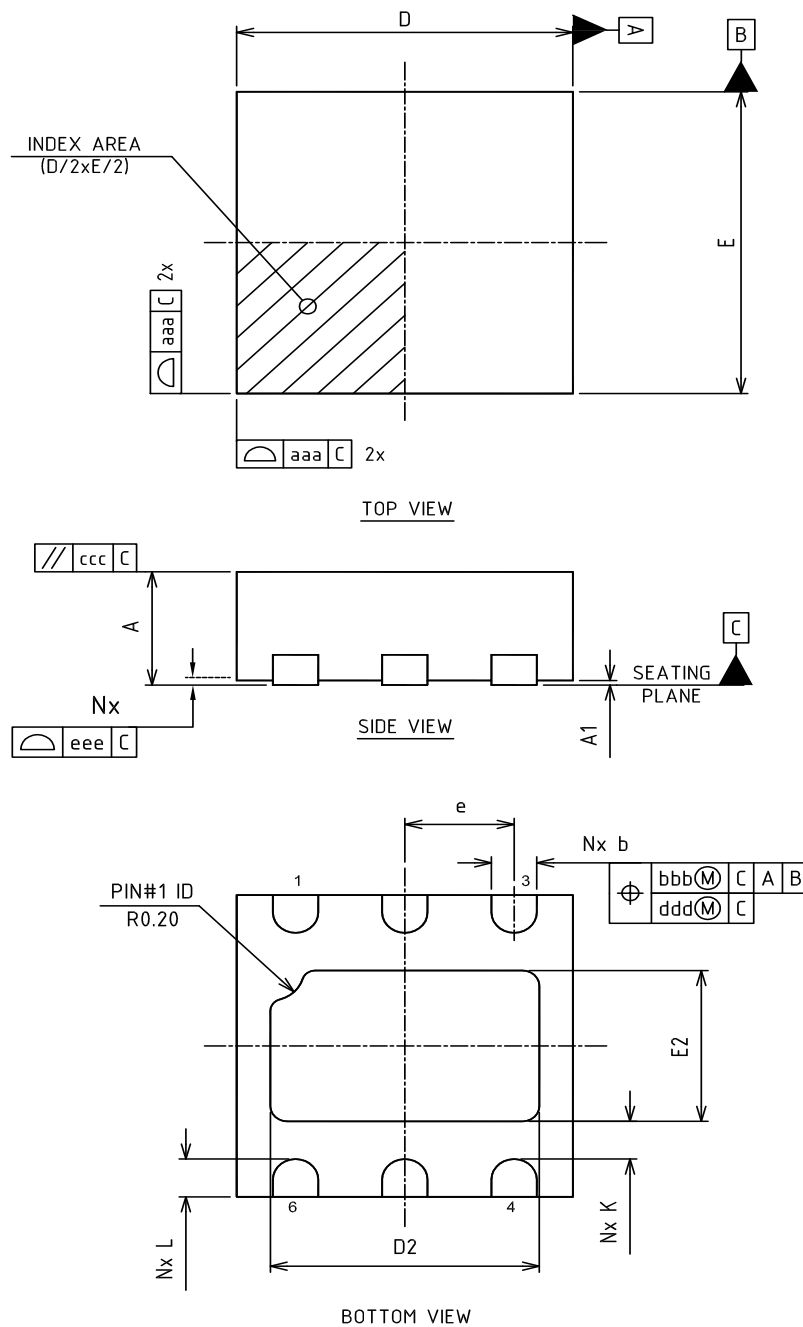
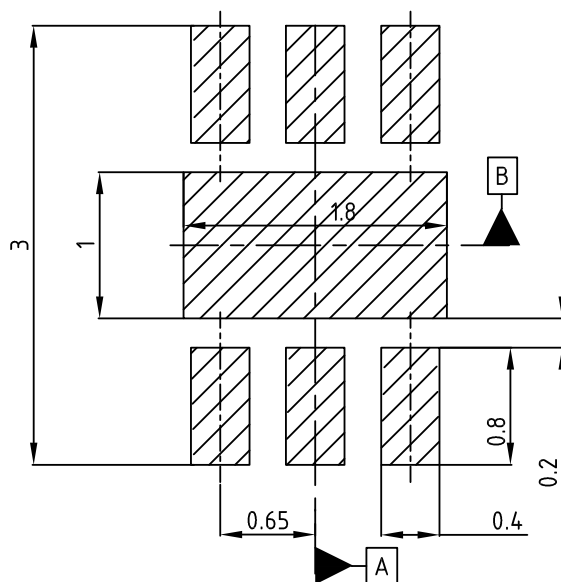


Table 11. DFN6 (2x2) mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.80	0.90	1.00
A1	0.00	0.02	0.05
b	0.25	0.30	0.35
D	2.00 BSC		
E	2.00 BSC		
e	0.65 BSC		
D2	1.45		1.70
E2	0.85		1.10
L	0.20		0.30
K	0.15		
aaa	0.05		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
N	6		

Figure 35. DFN6 (2x2) recommended footprint



Notes:

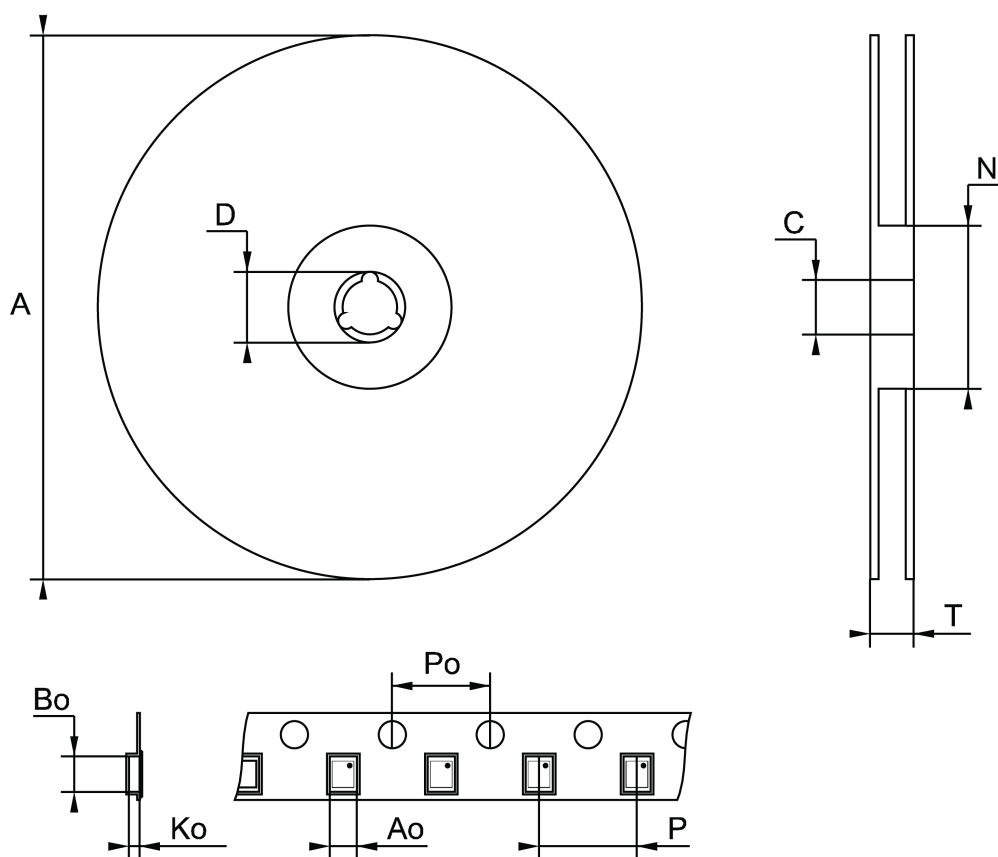
- 1) This footprint is able to ensure insulation up to 60 Vrms (according to CEI IEC 664-1)
- 2) The device must be positioned within

$\oplus$	0.02	A	B
----------	------	---	---

8518828_B

8.6 DFN6 (2x2) packing information

Figure 36. DFN6 (2 x 2 mm) reel outline



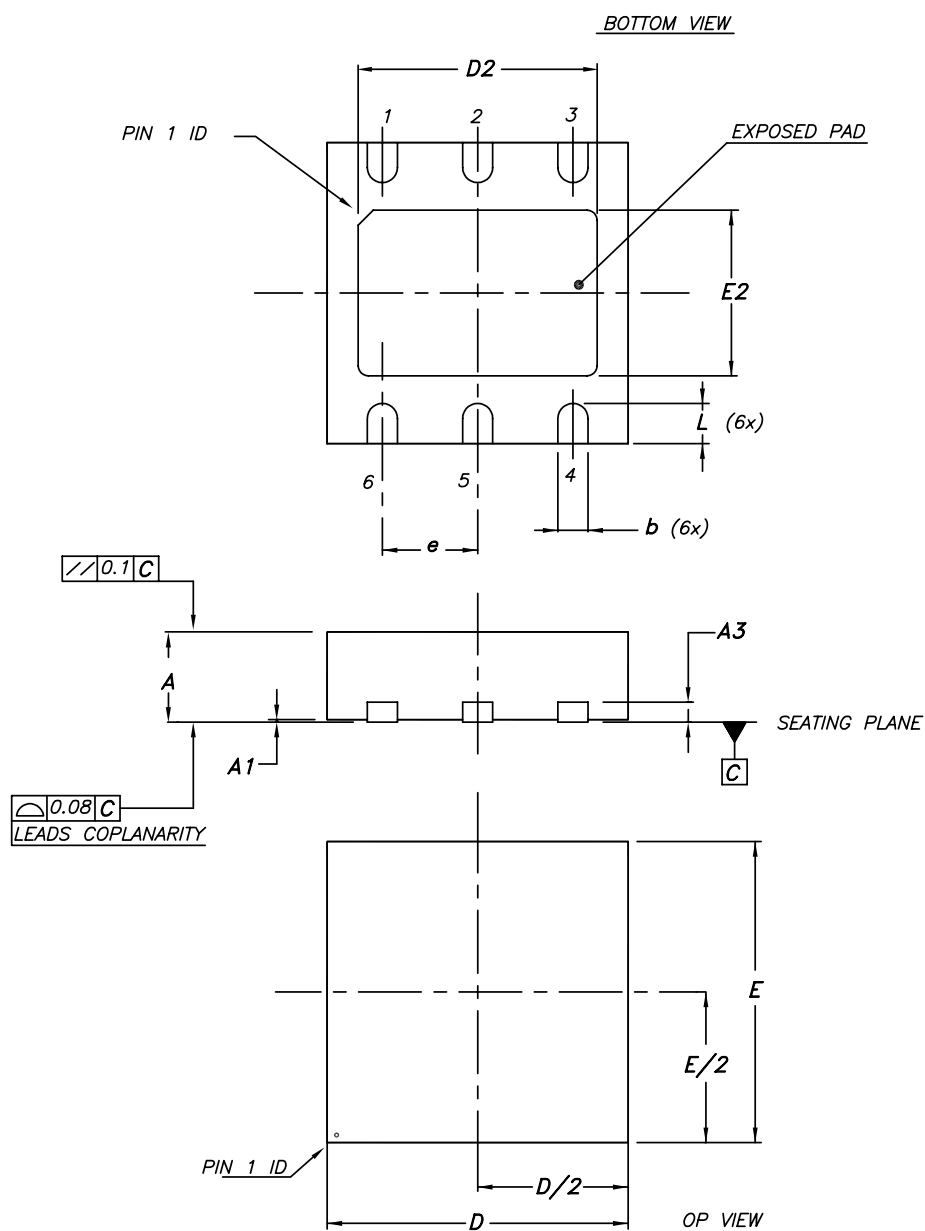
Note: Drawing not in scale

Table 12. DFN6 (2 x 2 mm) tape and reel mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A			180
C	12.8		13.2
D	20.2		
N	60		
T			14.4
A0		2.4	
B0		2.4	
K0		1.3	
P0		4	
P		4	

8.7 DFN6 (3x3) package information

Figure 37. DFN6 (3x3) package outline



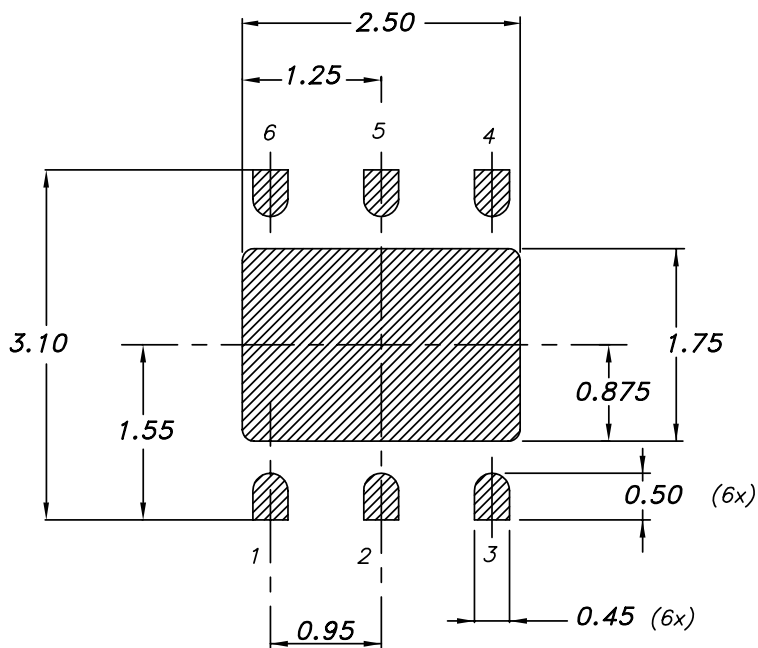
7946637_C

Table 13. DFN6 (3x3) mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.80		1
A1	0	0.02	0.05
A3		0.20	
b	0.23		0.45
D	2.90	3	3.10
D2	2.23		2.50
E	2.90	3	3.10
E2	1.50		1.75
e		0.95	
L	0.30	0.40	0.50

Figure 38. DFN6 (3x3) recommended footprint

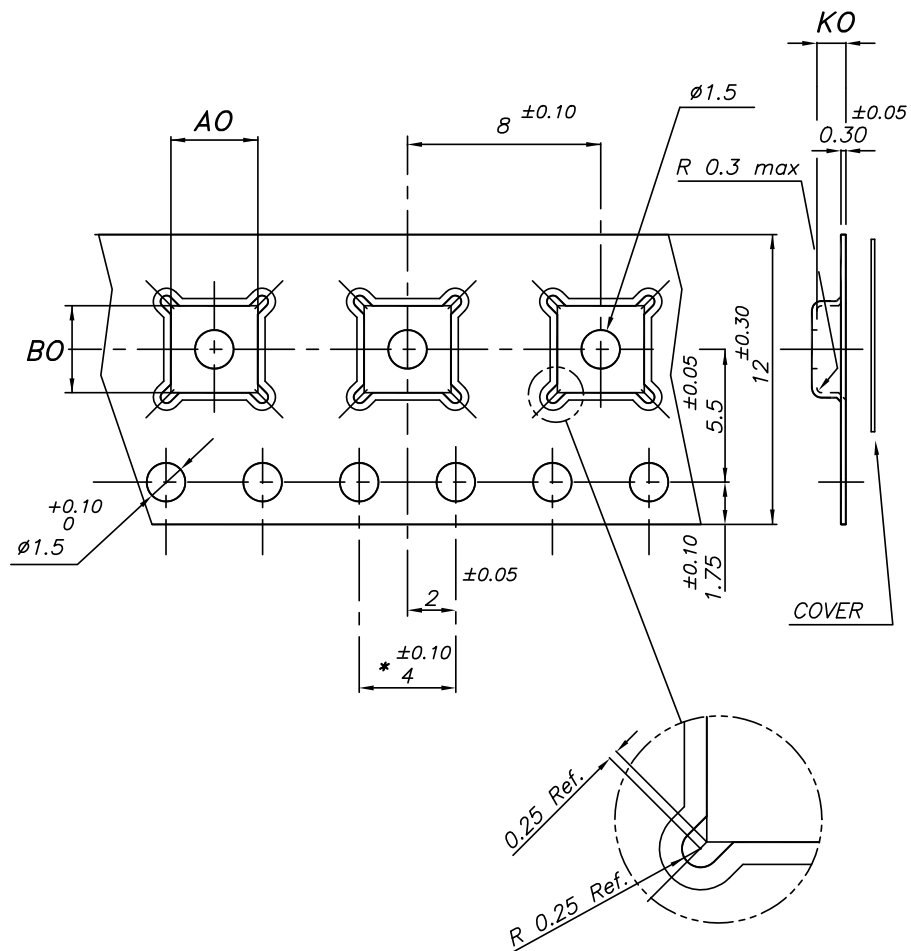
FOOTPRINT RECOMMENDED



7946637_C

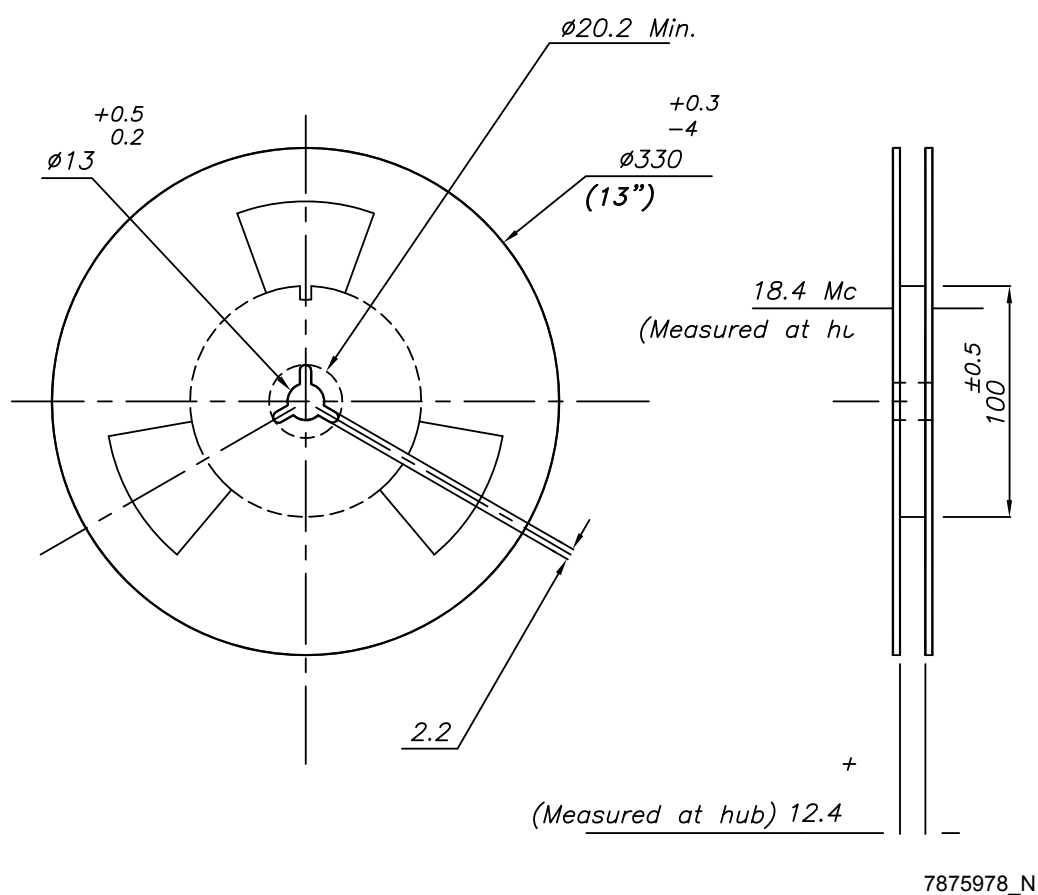
8.8 DFN6 (3x3 mm) packing information

Figure 39. DFN6 (3x3) tape outline



* 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.20

7875978_N

Figure 40. DFN6 (3x3 mm) reel outline

Table 14. DFN6 (3x3) tape and reel mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A0	3.20	3.30	3.40
B0	3.20	3.30	3.40
K0	1	1.10	1.20

9 Ordering information

Table 15. Order code

DPAK	PPAK	DFN6 (2x2)	DFN6 (3x3)	Output voltage
LDFM33DT-TR	LDFM33PT-TR	LDFM33PVR	LDFM33PUR	3.3 V
LDFM50DT-TR	LDFM50PT-TR			5 V
	LDFMPT-TR	LDFMPVR	LDFMPUR	ADJ from 0.8 V

Revision history

Table 16. Document revision history

Date	Revision	Changes
28-Aug-2012	1	Initial release.
22-Nov-2013	2	Part numbers LDFM and LDFM50 have been unified under LDFM. Updated the Features and the Description in cover page. Cancelled <i>Table 1: Device summary</i>. Updated <i>Section 2: Pin configuration</i>, <i>Section 3: Typical application</i>, <i>Section 4: Absolute maximum ratings</i>, <i>Section 5: Electrical characteristics</i> and <i>Section 8: Package information</i>. Added <i>Section 8.7: DFN6 (3 x 3 mm) packing information</i> and <i>Section 9: Order code</i>. Minor text changes.
15-Jun-2015	3	Updated <i>Table 5: Electrical characteristics for LDFM (fixed versions)</i> and <i>Table 6: Electrical characteristics for LDFM (adjustable version)</i>. Minor text changes.
05-Sep-2016	4	Updated <i>Section 9: "Ordering information"</i>. Minor text changes.
05-Jul-2017	5	Updated <i>Section 9: "Ordering information"</i>. Minor text changes.
03-May-2021	6	Added unit ΔV_{OUT} in <i>Table 6</i>. Updated <i>Figure 6</i> and <i>Figure 14</i>.

Contents

1	Block diagram	2
2	Pin configuration	3
3	Typical application	4
4	Absolute maximum ratings	5
5	Electrical characteristics	6
6	Application information	9
6.1	External capacitors	9
6.1.1	Input capacitor	9
6.1.2	Output capacitor	9
6.2	Enable pin operation	9
6.3	Power Good	9
7	Typical performance characteristics	10
8	Package information	14
8.1	PPAK package information	14
8.2	PPAK packing information	16
8.3	DPAK (TO-252) package information	18
8.4	DPAK (TO-252) packing information	21
8.5	DFN6 (2x2) package information	23
8.6	DFN6 (2x2) packing information	26
8.7	DFN6 (3x3) package information	27
8.8	DFN6 (3x3) packing information	29
9	Ordering information	31
	Revision history	32
	Contents	33
	List of tables	34
	List of figures	35

List of tables

Table 1.	Pin description DPAK, PPAK	3
Table 2.	Pin description DFN6-2x2 and 3x3	3
Table 3.	Absolute maximum ratings	5
Table 4.	Thermal data	5
Table 5.	Electrical characteristics for LDFM (fixed versions)	6
Table 6.	Electrical characteristics for LDFM (adjustable version)	7
Table 7.	PPAK mechanical data	15
Table 8.	PPAK tape and reel mechanical data	17
Table 9.	DPAK (TO-252) mechanical data	19
Table 10.	DPAK (TO-252) tape and reel mechanical data	22
Table 11.	DFN6 (2x2) mechanical data	24
Table 12.	DFN6 (2 x 2 mm) tape and reel mechanical data	26
Table 13.	DFN6 (3x3) mechanical data	28
Table 14.	DFN6 (3x3) tape and reel mechanical data	30
Table 15.	Order code	31
Table 16.	Document revision history	32

List of figures

Figure 1.	Block diagram (generic version)	2
Figure 2.	Pin connection (top view)	3
Figure 3.	Fixed versions	4
Figure 4.	Adjustable version (PPAK and DFN6 packages only)	4
Figure 5.	Output voltage vs temperature	10
Figure 6.	Output voltage vs temperature for adjustable	10
Figure 7.	Line regulation vs temperature	10
Figure 8.	Load regulation vs temperature	10
Figure 9.	Short-circuit current vs drop voltage	10
Figure 10.	Dropout voltage vs temperature	10
Figure 11.	Quiescent current vs temperature ($I_{OUT} = 10\text{ mA}$)	11
Figure 12.	Quiescent current vs temperature ($I_{OUT} = 500\text{ mA}$)	11
Figure 13.	Shutdown current vs temperature	11
Figure 14.	Enable pin current vs temperature	11
Figure 15.	Enable high threshold vs temperature	11
Figure 16.	Enable low threshold vs temperature	11
Figure 17.	Output voltage vs input voltage	12
Figure 18.	Line transient	12
Figure 19.	Load transient ($V_{OUT} = 3.3\text{ V}$)	12
Figure 20.	Load transient ($V_{OUT} = V_{ADJ}$)	12
Figure 21.	Startup transient	12
Figure 22.	Enable transient	12
Figure 23.	SVR vs frequency ($V_{OUT} = 5\text{ V}$)	13
Figure 24.	SVR vs frequency ($V_{OUT} = V_{ADJ}$)	13
Figure 25.	Stability plane adj (C_{OUT} , ESR)	13
Figure 26.	Stability plane 3.3 V (C_{OUT} , ESR)	13
Figure 27.	PPAK package outline	14
Figure 28.	PPAK tape outline	16
Figure 29.	PPAK reel outline	17
Figure 30.	DPAK (TO-252) package outline	18
Figure 31.	DPAK (TO-252) recommended footprint (dimensions are in mm)	20
Figure 32.	DPAK (TO-252) tape outline	21
Figure 33.	DPAK (TO-252) reel outline	22
Figure 34.	DFN6 (2x2) package outline	23
Figure 35.	DFN6 (2x2) recommended footprint	25
Figure 36.	DFN6 (2 x 2 mm) reel outline	26
Figure 37.	DFN6 (3x3) package outline	27
Figure 38.	DFN6 (3x3) recommended footprint	28
Figure 39.	DFN6 (3x3) tape outline	29
Figure 40.	DFN6 (3x3 mm) reel outline	30

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2021 STMicroelectronics – All rights reserved